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REMARKS

Favorable reconsideration of this application as presently amended is respectfully requested.

Claims 1 through 10, and 12 through 20 are pending. Claims 1 and 14 are amended and claim 11 is canceled. Support for the amendments to claims 1 and 14 may be found in the original claims, in FIG. 1 and other places throughout the specification.

The Examiner is thanked for indicating that claims 4 and 5 would be allowable if rewritten in independent format including all of the limitations of the base claim and any intervening claims, in order to overcome the objection of their being dependant upon a rejected base claim.

Additionally, Applicant respectfully notes that the Examiner did not indicate consideration of the articles disclosed on the submitted Form 1449 and thus request confirmation of consideration of such disclosures by the Examiner. A clean copy of the Form 1449 and a copy of the initialed Form 1449 are attached for the Examiner's convenience.

Claims 1, 2, 6, 10, 11 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Van Den Thillart *et al.* (herein, "Thillart"), U.S. Patent No. 5,771,304, in view of Hobelsberger, U.S. Patent No. 5,812,686 (herein,

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“Hobelsberger”). This rejection is respectfully traversed.

With respect to claim 1, claim 1 as amended claims an audio system, comprising: a cabinet having an opening in a first wall thereof; a first speaker for emitting audio output, said first speaker being mounted inversely at said opening of said cabinet; and a passive radiator for emitting audio output, said passive radiator mounted in said cabinet opposite said first speaker; and a sensor for sensing pressure caused by the audio output from said first speaker, said sensor being mounted in said cabinet by a sensor mounting structure joined to said cabinet, said sensor mounted in such a manner as to receive a signal from both the speaker and the passive radiator.

Thillart is cited for disclosing an apparatus including a loudspeaker unit, a housing and a speaker mounted inversely. Hobelsberger is cited for disclosing a sensing means for sensing pressure from a speaker.

At a minimum, neither Thillart nor Hobelsberger discloses the use of a passive radiator. Thillart discloses the use of a ported enclosure in FIG. 3. Ported enclosures generally increase the bass output of a speaker by around 3dB, compared to a mounted passive radiator cabinet, resulting in a flatter low frequency response. Ported enclosures contain a tubular shaped opening to achieve its design. Claim 1, on the contrary, recites a mounted passive radiator; therefore, neither Thillart nor Hobelsberger teach or suggest the use of a passive radiator as recited in claim 1, and

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thus claim 1 is patentable over Thillart and Hobelsberger.

In addition, neither Thillart nor Hobelsberger disclose a sensor mounted in such a manner as to receive a signal from both the speaker and the passive radiator as recited in claim 1. Therefore, Thillart and Hobelsberger fail to teach or suggest each element of claim 1, and thus claim 1 is patentable over Thillart and Hobelsberger.

Claims 2, 6, and 10-13 depend directly or indirectly from claim 1, and, accordingly, include all of the patentable features of claim 1 as well as other patentable features. Therefore, claims 2, 6, and 10-13 are patentable over Thillart, Hobelsberger, and Bertagni *et al.* (U.S. Patent No. 5,693,917) for the reasons discussed above with respect to claim 1. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection.

In particular, with respect to claim 12, Bertagni does not teach or suggest a mounted passive radiator or a sensor mounted in such a manner as to receive a signal from both the speaker and the passive radiator as recited in claim 1 and thus Bertagni fails to overcome the deficiencies of Thillart and Hobelsberger.

With respect to claim 14, claim 14 as amended claims a method for improving acoustical accuracy in an audio system comprising the steps of mounting a first speaker inversely in an opening of a wall of a cabinet; mounting a passive radiator in

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said cabinet opposite said first speaker; sensing pressure from audio output from the first speaker and the passive radiator; and adjusting the audio output from the first speaker based on the pressure sensed in said sensing step. Since, as the Examiner set forth, claim 14 discloses a method that corresponds substantially to the elements of the system of claim 1, claim 14 is patentable for at least the same reasons set forth above for claim 1. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claims 15, 16, 19 and 20 depend directly or indirectly from claim 14, and, accordingly, include all of the patentable features of claim 14 as well as other patentable features. Therefore, claims 15, 16, 19 and 20 are patentable for the reasons discussed above with respect to claim 14. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claims 1, 3, 8-9 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thillart in view of Tanaka *et al.* U.S. Patent No. 5,588,065 (herein, "Tanaka"). This rejection is respectfully traversed.

With respect to claim 1, claim 1 as amended claims an audio system, comprising: a cabinet having an opening in a first wall thereof; a first speaker for emitting audio output, said first speaker being mounted inversely at said opening of said cabinet; and a passive radiator for emitting audio output, said passive radiator mounted in said cabinet opposite said first speaker; and a sensor for sensing

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pressure caused by the audio output from said first speaker, said sensor being mounted in said cabinet by a sensor mounting structure joined to said cabinet, said sensor mounted in such a manner as to receive a signal from both the speaker and the passive radiator.

Thillart is cited for disclosing an apparatus including a loudspeaker unit, a housing and a speaker mounted inversely. Tanaka is cited for disclosing a sensor indicative of sensing pressure.

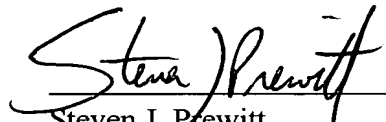
At a minimum, Tanaka merely discloses using a sensor to modify the resonance inherent in a "band pass speaker" to produce a flatter acoustical response. Alternatively, the system of claim 1 uses a feedback signal from the sensor to directly control the acoustical radiation from both the speaker and passive radiator. Additionally, the system of claim 1 is distinguished from Tanaka in that the speaker disclosed in Tanaka does not radiate because it is totally enclosed within the cabinet, whereas the speaker of claim 1 is an inverse speaker. Tanaka instead relies solely on a passive radiator to produce acoustical radiation. In claim 1, both the speaker and the passive radiator produce acoustical radiation. The placement of the sensor in the same enclosed space between the speaker and the passive radiator allows for the feedback signal to control the net radiation of both. Additionally, Thillart does not overcome the deficiencies of Tanaka. Therefore, Thillart and Tanaka do not teach or suggest each of the elements of claim 1; and thus, claim 1 is patentable over Thillart and Tanaka.

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Claims 3, 8-9 and 17-18 depend directly or indirectly from claim 1, and, accordingly, include all of the patentable features of claim 1 as well as other patentable features. Therefore, claims 3, 8-9 and 17-18 are patentable over Thillart and Tanaka for the reasons discussed above with respect to claim 1. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection.

If the Examiner has any questions or concerns regarding the present response, the Examiner is invited to contact Steven J. Prewitt at 703-591-2664. In view of the foregoing, it is respectfully submitted that this application is in condition for allowance, and favorable action is respectfully solicited.

Respectfully submitted,


Steven J. Prewitt
Reg. No. 45,023

Attachments:

Clean Copy of Form 1449

Copy of Form 1449 Initialed (in part) by Examiner

Jagtiani + Gutttag

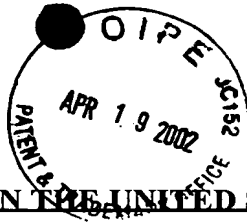
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April 19, 2002



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
)	
MULLINS, Joe H.)	Examiner: GRIER, Laura A.
)	
Serial Number: 09/389,085)	Art Unit: 2644
)	
Filed: September 2, 1999)	
)	
For: LOW FREQUENCY FEEDBACK)	Docket No.: UNME-0019-1
CONTROLLED AUDIO SYSTEM)	

**Director of the U.S. Patent and Trademark Office
Washington, D.C. 20231**

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Sir:

Below are the amendments in the accompanying Amendment for the above-identified application shown in redlined format:

IN THE CLAIMS

Please amend the claims, without prejudice or disclaimer, as indicated below:

Please cancel claim 11.

1. (Amended) An audio system, comprising:

a cabinet having an opening in a first wall thereof;

a first speaker for emitting audio output, said first speaker being mounted
inversely at said opening of said cabinet; and

~~_____ a passive radiator for emitting audio output, said passive radiator mounted in
said cabinet opposite said first speaker; and~~

a sensor for sensing pressure caused by the audio output from said first
speaker, said sensor being mounted in said cabinet by a sensor mounting structure

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joined to said cabinet, said sensor mounted in such a manner as to receive a signal from both the speaker and the passive radiator.

2. The audio system of claim 1, wherein said audio system comprises a low frequency audio system.
3. The audio system of claim 1, wherein said sensor comprises a second speaker.
4. The audio system of claim 1, wherein said sensor mounting structure comprises a damped elastic mounting structure.
5. The audio system of claim 1, wherein said sensor mounting structure comprises an enclosure mounted on said first wall and including said opening in said first wall.
6. The audio system of claim 1, further comprising a means for adjusting the audio output of said first speaker based on said pressure sensed by said sensor.
7. The audio system of claim 1, wherein said first speaker has a speaker maximum width and said sensor has a sensor maximum width, and said sensor maximum width is smaller than said speaker maximum width.
8. The audio system of claim 1, wherein said sensor has a signal-to-noise ratio of

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at least of 100 dB.

9. The audio system of claim 1, wherein said audio system has a feedback factor of 30 to 50 dB when said first speaker operates at a frequency of about 15 to 300 Hz.

10. The audio system of claim 1, further comprising acoustic absorbing material contained in said cabinet.

12. The audio system of claim 1, wherein said first speaker comprises an electrodynamic planar speaker.

13. The audio system of claim 1, wherein said first speaker comprises an electrostatic planar speaker.

14. (Amended) A method for improving acoustical accuracy in an audio system comprising the steps of:

mounting a first speaker inversely in an opening of a wall of a cabinet;

mounting a passive radiator in said cabinet opposite said first speaker;

sensing pressure from audio output from the first speaker and the passive radiator; and

adjusting the audio output from the first speaker based on the pressure sensed in said sensing step.

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15. The method of claim 14, wherein the audio system comprises a low frequency audio system.

16. The method of claim 14, wherein the sensor comprises a second speaker.

17. The method of claim 14, wherein said sensing step is performed by a sensor having a signal-to-noise ratio of at least of 100 dB.

18. The method of claim 14, wherein said method produces an audio system feedback factor of 30 to 50 dB when the first speaker operates at a frequency of about 15 to 300 Hz.

19. The audio system of claim 14, wherein said first speaker comprises an electrodynamic planar speaker.

20. The audio system of claim 14, wherein said first speaker comprises an electrostatic planar speaker.